

## **BIODIVERSITY ALONG THE BORDER COMMITTEE**

### **STRATEGIES FOR CONSIDERATION**

#### **INTRODUCTION**

The California Biodiversity Council (CBC) met on September 27-28, 2006 in the City of Coronado. The theme of the meeting was “Biodiversity Along the Border – Working Together in a Binational Watershed.” The two-day meeting focused on three main topics:

- Biodiversity, habitat, wildlife corridors, and water quality along the border;
- Trends in growth and development and the underpinnings for those trends;
- Conservation challenges facing the three levels of government (from both sides of the border) to accommodate the needs of the largest commercial border crossing in the world.

The Council was joined by Mexican officials from the federal government, the State of Baja California, and the City of Tijuana. The Council discussed challenges and opportunities for transborder cooperation along the US Mexican Border, and heard presentations on the Las Californias Binational Conservation Initiative and the Otay Mesa/Mesa de Otay Binational Corridor Strategic Plan.

The Council concluded its meeting by forming the “Biodiversity Along the Border” committee to identify next steps to improve cross-border biodiversity and water quality. The Council directed that Committee members would include key staff representatives from the Resources Agency, California Department of Fish and Game, US Fish and Wildlife Service, US Geological Service, Bureau of Land Management, California Department of Parks and Recreation, California State Coastal Conservancy, US Forest Service, US Environmental Protection Agency, California Environmental Protection Agency, State Water Resources Control Board, Integrated Waste Management Board, and the San Diego Association of Governments.

A small number of non-CBC members with specific expertise and interests were also asked to join the committee. These members include the US Department of Homeland Security, the International Boundary and Water Commission, and the City and County of San Diego; and non-governmental organizations including The Nature Conservancy, the International Community Foundation, the Conservation Biology Institute, and Pronatura.

## **BIODIVERSITY ALONG THE BORDER COMMITTEE**

The Biodiversity Along the Border Committee met four times between the months of January and July 2007. To expedite the discussion, the committee divided into two work groups – the Las Californias Work Group and the Tijuana River Estuary Issues Work Group. The two groups worked independently, reporting their findings at the end of each meeting. This report represents their conclusions and recommendations. The committee agreed by consensus vote on July 17, 2007 to submit this report to the California Biodiversity Council.

### **Las Californias Work Group**

The Las Californias Work Group explored ways to advance recommendations from the Las Californias Binational Conservation Initiative. Kathy Viatella (The Nature Conservancy) and Miguel Vargas (Pronatura) co-chaired the group. Other members include:

#### **CALIFORNIA**

San Diego Association of Governments  
California Department of Fish and Game  
California Environmental Protection Agency  
California Department of Forestry and Fire Protection  
California Department of Transportation (CalTrans)  
California Resources Agency  
USDA Forest Service  
USDA Natural Resource Conservation Service  
USDI Bureau of Land Management  
USDI Fish and Wildlife Service  
International Community Foundation  
The Nature Conservancy  
Conservation Biology Institute  
County of San Diego  
Southwest Consortium for Environmental Research and Policy

#### **BAJA CALIFORNIA**

Secretaría Protección al Medio Ambiente del Estado de Baja California  
SEMARNAT, Secretaría del Medio Ambiente y Recursos Naturales  
PROFEPA, Procuraduría Federal de Protección Ambiental  
Pronatura  
Parque Nacional Constitución de 1857  
Cónsul General de México (en San Diego)  
Cónsul para Asuntos Políticos y Económicos y Fronterizos  
Secretaría de Fomento Agropecuario  
CONAFOR, Comisión Nacional Forestal  
XVIII Ayuntamiento en Tijuana  
Instituto Municipal de Planeación (IMPlan)  
XVIII Ayuntamiento en Mexicali, Municipio de Mexicali  
XVIII Ayuntamiento en Ensenada, Municipio de Ensenada  
XVIII Ayuntamiento en Rosarito

XVIII Ayuntamiento en Tecate  
CILA – Sección Mexicana-Mexicali  
CILA – Sección Mexicana-Tijuana, Comisión Internacional de Limites y Agua  
CONAGUA, Comisión Nacional del Agua  
CEA, Comisión Estatal del Agua  
SAGARPA, Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentación  
SEFOA, Secretaria de Fomento Agropecuario del Estado de B.C.  
The Nature Conservancy

### **Tijuana River Estuary Issues Work Group**

The Tijuana River Estuary Issues Work Group focused on watershed issues including sediment, polluted waste water, and tires and trash that impact the health of the Tijuana Estuary. Clay Phillips, California State Parks, chaired the group. Other members include:

#### **CALIFORNIA**

California Department of Parks and Recreation  
California Environmental Protection Agency  
California Integrated Waste Management Board  
California Department of Conservation  
California Water Resources Control Board  
State Coastal Conservancy  
US Geological Survey  
US Environmental Protection Agency  
US Fish and Wildlife Service  
City of San Diego  
City of Imperial Beach  
County of San Diego  
International Community Foundation  
International Boundary and Water Commission  
US Department of Homeland Security  
San Diego State University

#### **BAJA CALIFORNIA**

CILA – Sección Mexicana-Tijuana  
CESPT, Comisión Estatal de Servicios Públicos-Tijuana  
IMPlan, Instituto Municipal de Planeación  
Mexico Consul in the United States

Working in the border region presents challenges due to cross-border differences in land ownership, conservation patterns, legal mechanisms, and available financial resources for achieving land conservation and ecosystem health. Binational efforts require the work of many partners, which is where the California Biodiversity Council has made a significant contribution. By bringing together local, state, and federal agencies and non-governmental organizations from both sides of the border, the Council helped facilitate a collaborative conservation planning and watershed protection discussion which lead to the recommended strategies set forth in this report.

## **LAS CALIFORNIAS Work Group**

### **BACKGROUND/ISSUES DISCUSSED**

Las Californias, the border region of California and Baja-California, lies at the center of a global biodiversity hotspot that supports an extraordinary number of plants and animals that occur nowhere else on earth. It is also a landscape of unique natural beauty that affords its residents with water supplies, recreational opportunities and an exceptional quality of life. Unfortunately, many of these benefits and the native species that inhabit the landscape are under threat. Las Californias supports a growing metropolitan area from San Diego to Tijuana and Tecate. The coastal corridor is already home to nearly 4 million people, and another million residents are expected by 2020 (SDSU). Most of this growth is expected to occur on the outskirts of Tijuana and Tecate and along the California-Baja California border (SDSU 2005). This rapid pace of growth threatens to sever the two Californias and will result in fragmentation of the rural landscape and severely challenge the integrity and functionality of the ecosystems and natural resources they support.

Major investments have been made in conserving public lands on the United States side of the border. These conservation investments are at risk unless steps are taken to maintain the connectivity between these wildlands. Within the region, nearly 61% of undeveloped lands are in public ownership and have been set aside as conserved or multi-use open space. They include lands administered by the Bureau of Land Management, the U.S. Forest Service, U.S. Fish and Wildlife Service, California Department of Fish and Game, Cuyamaca Rancho and Anza-Borrego Desert State Parks, California Department of Forestry and Fire Protection, and the City and County of San Diego (CBI et al. 2004). By contrast, less than 1% of undeveloped land in the Baja California border region is in public ownership. (CBI et al. 2004) However, land use patterns on both sides of the border are such that there remain opportunities to achieve conservation of the unique natural resources of the region and maintain connectivity among conserved lands.

In 2003, The Nature Conservancy, Conservation Biology Institute, and Pronatura, a Mexican non-governmental organization, launched a science-based effort to develop a binational habitat conservation plan using state-of-the-art techniques and fundamentals of conservation biology. A central goal of the analysis was to identify areas with the following characteristics:

- Large, intact wildlands that sustain natural resources and ecological processes.
- Areas that represent regional biodiversity patterns across the full spectrum of geographic and climatic gradients.
- Irreplaceable resources that are unique or highly restricted in their distribution, such as vernal pools, bighorn sheep, Tecate Cypress or Martirian succulent scrub.
- Landscape linkages between these areas where the focus of conservation efforts might be able to ensure that human land uses remain compatible with wildlife movement and other ecological processes.

The product of this analysis was summarized in *Las Californias Binational Conservation Initiative: A Vision for Habitat Conservation in the Border Region of California and Baja California* (CBI et al. 2004), which provides a vision for a conservation network that is

necessary to protect in order to preserve the ecological integrity and biodiversity that is the legacy of the California – Baja California borderlands (Fig. 1).

The Las Californias work group identified opportunities for and barriers to collaboration among the local, state and federal agencies on both sides of the border necessary to implement the Las Californias vision. Each agency from the CBC reviewed the recommendations in the Las Californias Initiative to determine if there were (1) opportunities within existing agency programs and projects to implement some of the strategies set forth, and (2) potential sources of funding for conservation efforts along the border and across the border.

## **Cross Border Linkages**

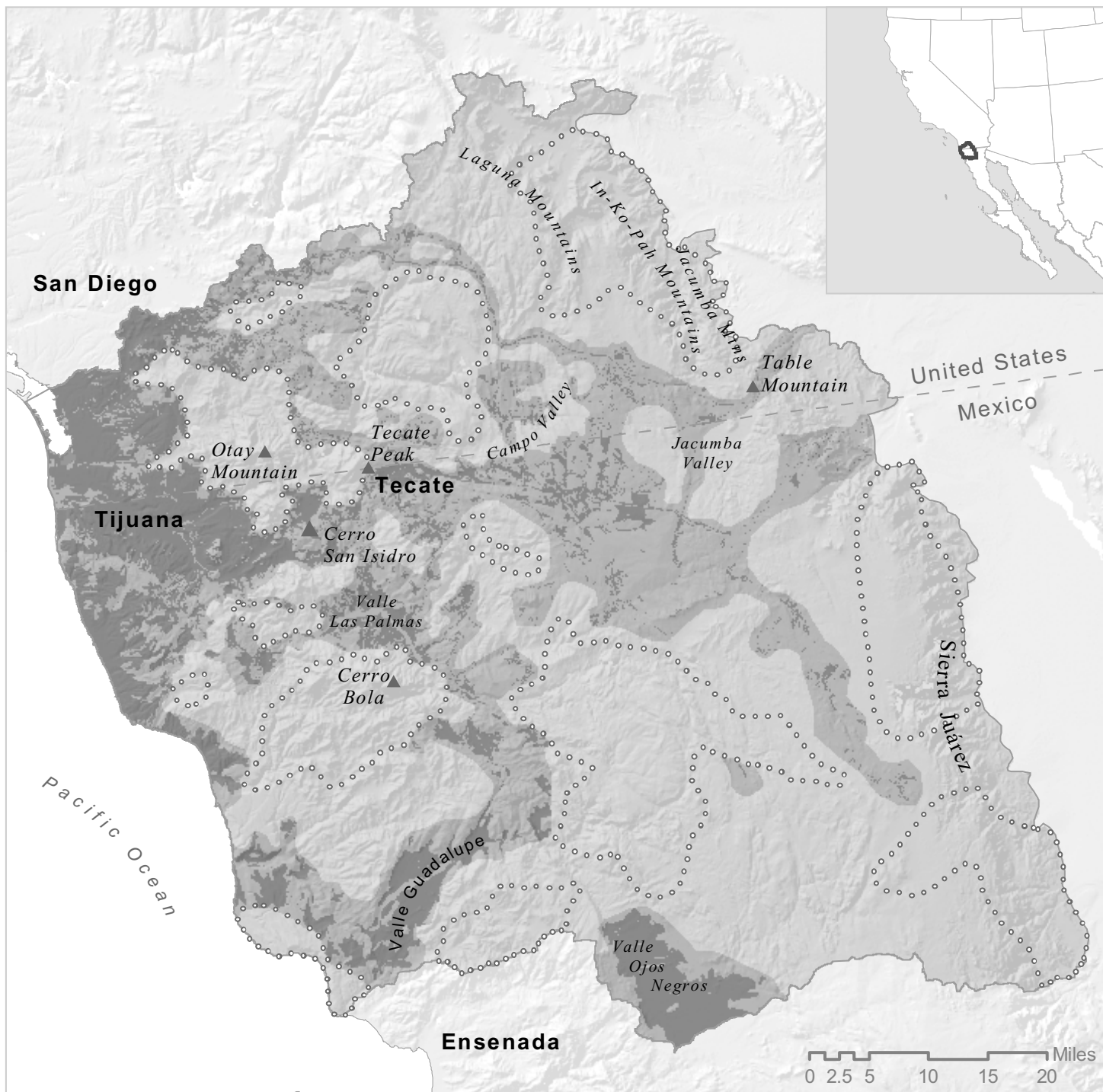
In concert with one of the main goals of the Las Californias Initiative, the work group agreed to focus on maintaining cross-border habitat linkages through strong cooperation among government agencies. Two primary linkages identified in the Las Californias Initiative present an opportunity to work binationally on their conservation (Fig. 2).

1. Coastal cross-border linkage between Tijuana and Tecate / San Diego and Campo. This linkage supports some of the last remaining intact patches of Diegan coastal sage scrub in the border region and would link the “sky island” habitats of Cerro San Isidro, Otay Mountain, and the Laguna Mountains. This area is also identified as an important conservation area as part of the Southwest recovery unit for the federally endangered Quino checkerspot butterfly (USFWS 2003). Desired outcomes include:
  - A Natural Protected Area at Cerro San Isidro
  - Private lands conservation in the vicinity of Cerro San Isidro including leases, easements and purchase
  - Conservation through working landscapes and new management activities
  - Conservation of urban green space in Tijuana and Tecate
  - Conservation of green space along Rio Tecate and Rio Alamar
  - Conservation of the Cottonwood Creek corridor between Otay Mountain and the Laguna Mountains
  - Increasing the core areas at Hauser Mountain and Hauser Wilderness
2. Montane cross-border linkage / Park to Parque Linkage - the mountain chain that extends from the Laguna Mountains in Southern California to the Sierra Juárez in northern Baja California supports chaparral, montane pine forests, juniper woodlands, scattered mountain meadows, and Sonoran Desert scrub. This area is an important north-south linkage where species diversity and endemism are very high. The southernmost U.S. population of the Peninsular bighorn sheep occurs here, which is currently isolated from the Mexican population in the Sierra Juárez. This area is also an important conservation target for Southeast recovery unit for the federally endangered Quino checkerspot butterfly. Desired outcomes include:
  - A new trans-boundary conservation area linking Anza-Borrego Desert State Park with Parque Nacional Constitución de 1857 in Baja California

# Figure 1. Las Californias Binational Conservation Initiative

The Nature Conservancy  
Protecting nature. Preserving life.™

pro  
natura  
BIOLOGIST



Intensive - urban development

*Vision: Protect environmental health, urban greenspace, restricted species*

Moderately intensive - ag and rural development

*Vision: Protect ecosystem services, wildlife corridors, sustainable communities*

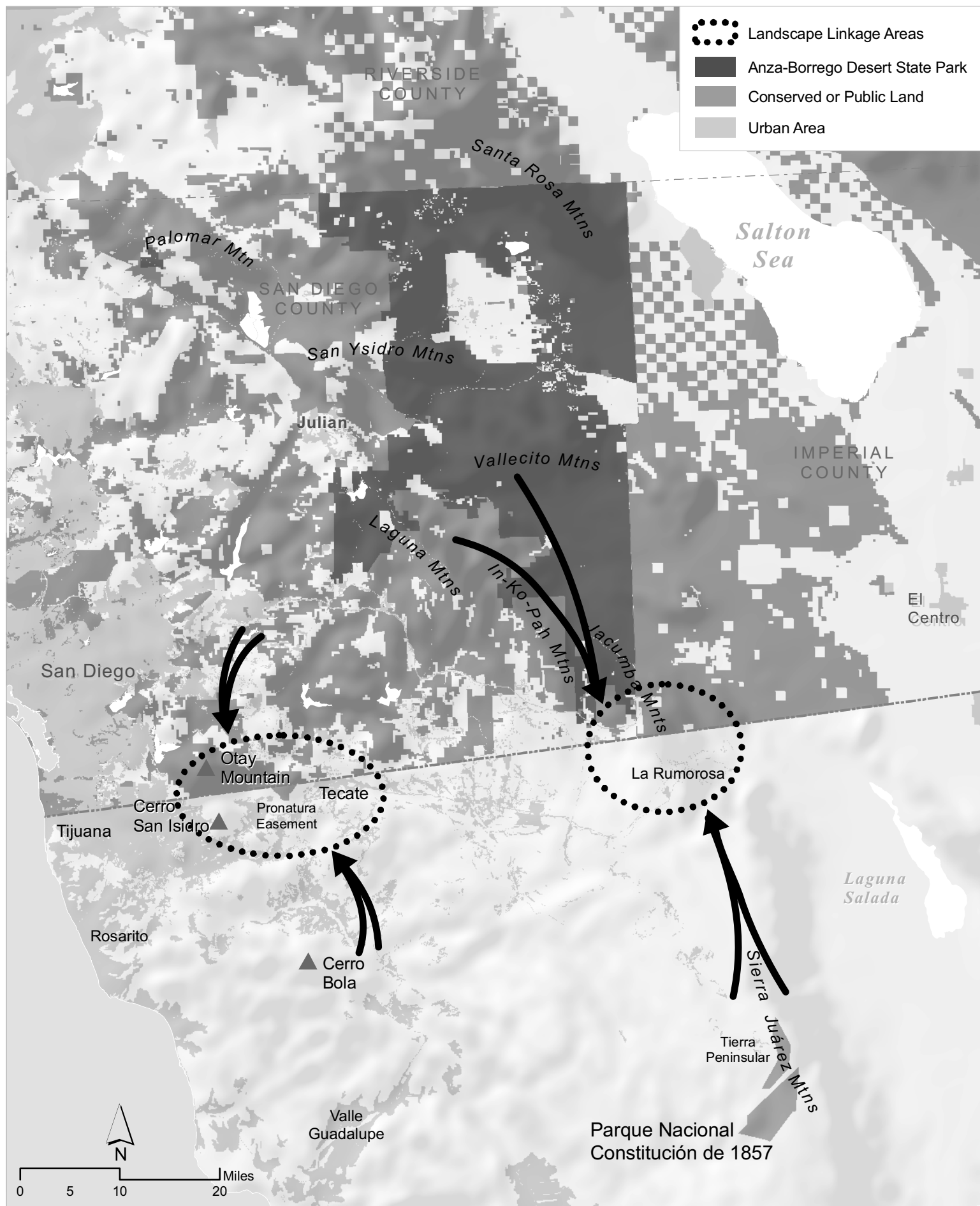
Light - grazing and working landscapes

*Vision: Protect ecological processes, landscape permeability, & compatible development*

Natural landscapes with minimal human impacts

*Vision: Protect ecological function & intactness, and the viability of representative biodiversity*

Figure 2. Las Californias Binational Conservation Initiative Transboundary Linkages





- A new protected area of 150,000 hectares from the U.S.-Mexican border to the southern end of the Sierra Juárez mountain range
- Conservation of Parque Nacional Constitución de 1857 through new management activities
- Private lands conservation in Baja California including leases, easements and purchase of key private inholdings in the newly formed National Protected Area
- Private land conservation in San Diego including conservation easements and fee title acquisition of key properties to secure a north-south linkage

## **STRATEGY**

To address the two opportunities identified by the Biodiversity Along the Border Committee, the creation of a Las Californias Binational Working Group was proposed that will continue the work of the Las Californias Work Group in advising strategies for conservation.

The mission of this working group is to conserve cross-border habitat linkages in the borderlands of California and Baja-California through binational cooperation.

The composition of the working group will be determined on a voluntary basis. It is proposed that the co-chairs of the working group be representatives of the state of California and the state of Baja California. The California Resources Agency has agreed to be a co-chair. An invitation to the Secretaria Protección al Medio Ambiente del Estado de Baja California, which is the sister agency to California Resources Agency, will be extended.

The Las Californias Binational Working Group will be a voluntary body supported by the participants. It is proposed that Working Group be comprised of the suggested agencies from the United States and Mexico.

## **Suggested U.S. Members**

### Local agencies/municipalities

San Diego Association of Governments

County of San Diego

City of San Diego

### State agencies

California Department of Fish and Game

California Department of Forestry and Fire Protection

California Department of Parks and Recreation

California Department of Transportation (CalTrans)

California Environmental Protection Agency

California Resources Agency

### Federal agencies

USDA Forest Service

USDA Natural Resource Conservation Service

USDI Bureau of Land Management



USDI Fish and Wildlife Service

Non-governmental organizations

International Community Foundation

The Nature Conservancy

Conservation Biology Institute

Southwest Consortium for Environmental Research and Policy

**Suggested Mexico Members**

Local agencies/municipalities

Dirección de Protección al Ambiente de Tijuana

Instituto Municipal de Planeación de Tijuana (IMPLAN)

Municipio de Tecate

State agencies

Secretaria de Fomento Agropecuario del Estado de B.C. (SEFOA)

Secretaría de Infraestructura y Desarrollo Urbano (SIDUE)

Secretaría de Protección al Ambiente del Estado de Baja California

Federal agencies

Comisión Nacional del Agua (CNA)

Comisión Nacional de Áreas Naturales Protegidas (CONANP)

Comisión Nacional Forestal (CONAFOR)

Consulado de México en San Diego

Instituto Nacional de Ecología (INE)

Secretaria del Medio Ambiente y Recursos Naturales (Semarnat)

Non-governmental organizations

Fundación La Puerta

Pronatura Noroeste

Proyecto Fronterizo de Educación Ambiental

The Nature Conservancy Baja California

Terra Peninsular

**Next Steps:**

The next steps for the Working Group are to convene a meeting the purpose of which will be 1) to develop a strategy for ensuring administrative support for future meetings and 2) to develop a work plan that identifies the necessary steps for achieving the conservation goals described below. This work plan will help to inform what will be the respective roles of each of the member agencies of the Working Group.

1. Conserve the Coastal Cross-Border Linkage between Tijuana and Tecate

The greatest threat to this linkage is fragmentation caused by rapid development between Tijuana and Tecate. SANDAG and The City of Tijuana's Municipal Planning Institute (IMPlan) are

working on the development of the Otay Mesa – Mesa de Otay Binational Corridor Strategic Plan in collaboration with the State of Baja California’s Secretariat of Infrastructure and Urban Development (SIDUE) and Caltrans District 11. The purpose of the plan is to develop an effective binational planning partnership that addresses transportation, economic development, housing, and environmental conservation needs comprehensively.

The plan currently recognizes the vision and goals for conserving a coastal cross-border linkage within the area between Tijuana and Tecate, as identified in the Las Californias Binational Conservation Initiative. The next step is to identify potential sources of funding to protect the remaining open space in this area.

IMPLAN is seeking funding to study the feasibility of exchanging development rights for open space mitigation. The initial study area is focused on the Cerro Isidro and Jesus Maria mountain areas. IMPLAN is also seeking funding to explore possibilities for cooperative agreements among the private, public, and community sectors, to build partnerships and private agreements while incorporating the payment for environmental mitigation, purchase of development rights, permits or quota rights, and other similar uses.

The Las Californias Binational Committee could support and assist IMPlan in applying for grants or other opportunities that would result in potential funding sources. Funding is intended to develop the framework for other potential conservation opportunities that may be pursued.

Steps may include:

- Identify landowners willing to work with the Committee on conservation of their lands.
- Conduct biological surveys of identified lands.
- Develop proposal(s) for the use of legal tools to conserve the land, incentives for conservation, and justification for conservation.
- Identify strategies and costs for biological management and monitoring and the entity that will be responsible for long-term management.
- Identify sources of funds to establish an endowment.

## 2. Conserve Park to Parque Linkage

The Las Californias Binational Committee would serve as advisors to agencies involved in conservation efforts on both sides of the border. The Nature Conservancy, Conservation Biology Institute, and Mexican non-governmental organizations, including Pronatura and Terra Peninsular, will initiate the steps to implement this long-term vision. These steps may include:

- Identify boundaries for the proposed study area on both sides of the border.
- Complete land tenure studies for the study area in Mexico and identify landowners willing to conserve their lands on both sides of the border.
- Work with individual stakeholders over the next 6 months to discuss specific conservation strategies.

- Evaluate examples on the U.S.-Mexico border and U.S.-Canada border where binational conservation areas have already been established and the mechanisms used.
- Hold a workshop with all stakeholders in early 2008 to present, discuss, and launch the strategies set out by the Committee and stakeholders.
- Hold donor tours and events to heighten awareness of the Initiative and to raise money for conservation.
- Work with the San Diego Natural History Museum and Mexican agencies and academic institutions on a binational expedition to increase our understanding of resources in the study area on both sides of the border.
- Establish cooperative partnerships between California State Parks and Parque Nacional Constitución de 1857.
- Explore opportunities with Comisión Nacional de Areas Naturales Protegidas (CONANP) and Comisión Nacional Forestal (CONAFOR).
- Identify priority properties for inclusion in a Conceptual Area Protection Plan (CAPP).
- Ensure that the Committee's objectives are considered in the East San Diego County MSCP.
- Prepare a prospectus that summarizes the objectives, strategies, and costs of conservation implementation for the Park-to-Parque linkage.

In addition to the foregoing conservation goals, there may be other opportunities for binational collaboration on conservation issues. The Tijuana Estuary issues group has recommended that the Las Californias Binational Working Group consider how it might expand the use of conservation easements in two sub-basins, Yogurt Canyon and Matadero Canyon, to achieve conservation goals set for the Tijuana Estuary. This opportunity will be a topic for discussion at the first meeting of the Working Group.

## **TIJUANA RIVER ESTUARY ISSUES Work Group**

### **BACKGROUND/ISSUES DISCUSSED**

The Tijuana River watershed is a binational watershed under intense threat from environmental degradation. One quarter of the watershed is in the U.S. and three quarters in Mexico. After the Tijuana River crosses into the U.S., it passes through one of the most important wetland/salt marsh estuary complexes remaining in Southern California, the 2,500-acre Tijuana River National Estuarine Research Reserve (TRNERR). Along the estuary's southern boundary lies the fast-growing City of Tijuana, where rapid growth and development upstream has led to increased flows of sediment, trash, and polluted stormwater downstream into the estuary. Managing environmental impacts has become a challenge for both countries.

The watershed covers 1,700 square miles. Urban, agricultural, and industrial uses all impact the watershed from its headwaters in the mountains of Mexico to its mouth in the U.S. at the Tijuana River Estuary. Management of water quality and habitat preservation is extremely complex due to political boundaries, as well as social and economic differences between the U.S. and Mexico. The eastern part of the watershed is lightly developed, but the western end contains intense development in the fast-growing adjacent metropolitan areas of Tijuana and San Diego. This has created numerous environmental problems for the residents of both countries, including a decline in quality surface and groundwater for human use; increased erosion and flood dangers; a reduction in the amount of open, safe, green areas for urban residents; a decrease in ecosystem health; and an increasing number of threatened and endangered plants and animals.

The TRNERR is the end point for the entire watershed. This NOAA-designated Reserve includes the Tijuana River National Wildlife Refuge and California's Border Field State Park. The Reserve is also one of four sites in California (and only 23 in the U.S.) that has been designated by the International Ramsar Convention as a "wetland of international importance."

The TRNERR protects coastal wetland habitat for over 370 bird species as well as endangered plants, fish, and wildlife. This unique area represents the only major estuary in Southern California not bisected by roads or railways. It is an excellent example of the wetlands habitat that, in the past, was a prominent feature in Southern California's coastal zone; today, more than 90% of those wetlands have been converted for coastal development or degraded due to urban encroachment. In addition to its habitat value, the estuary is also a natural filter for water flowing to the Pacific Ocean and to nearby beaches.

Protection of the watershed, the estuary, and the quality of life for citizens living along the border, can only be addressed through binational efforts. Over the past three years, public agencies and non-governmental organizations (NGOs) in the U.S. and Mexico have come together to focus on Los Laureles Canyon, a large source of sediment and trash flowing into the Reserve. Participants have included The International Community Foundation (ICF), the Reserve's Coastal Training Program (CTP), Mexican NGOs, The City of Tijuana, the State of Baja California, and universities in San Diego and Tijuana.

The TRNERR and its partners have chosen to focus attention on the Los Laureles community of San Bernardo in hopes that it can become a model for sustainable practices that can be replicated in communities throughout the watershed. Many of the proposed strategies expand on San Bernardo pilot projects, which focus on small-scale erosion control measures involving the community.

The Tijuana River Estuary Work Group organized their discussions by issue area; identifying strategies to improve the ecosystem health of the estuary. Strategies address the need for sewer systems in neighborhoods located upstream on hillsides overlooking the estuary, the need for new and/or retrofitted water diverters at the border's water treatment plant, the need for sediment basins in key locations on both sides of the border, and the need to find ways to stop the flow of trash and waste tires into the estuary. Each issue requires a partnership among government agencies and NGO's from both countries.

## **1. SEWER PROJECT**

### **Issues**

In partnership with the State Coastal Conservancy, the International Community Foundation, the City of Tijuana and non-profit organizations in Mexico, the TRNERR has established a pilot project in the upper reaches of Los Laureles Canyon that demonstrates how a neighborhood can be redeveloped, at low cost, to become environmentally sensitive and sustainable. A significant missing piece in this demonstration project is sewer treatment. A lack of basic sewage infrastructure in rapidly urbanizing areas such as Los Laureles Canyon will continue to generate serious effects to local citizens and on downstream reserve resources.

The work group brought in the San Diego Professional Chapter of Engineers Without Borders (EWB – SD) to provide expertise on providing sewer treatment in San Bernardo a neighborhood located in Los Laureles Canyon. EWB – SD is proposing a sewage collection and treatment system for the existing elementary school in San Bernardo and approximately 10-15 existing homes, while providing the capacity for an additional 35-40 homes. The project would most likely be laid under roadways using conventional trenching and pipe materials. Each home would be piped to shared septic tanks, which are in turn piped into a main trunk pipe leading to a treatment system. It is likely that the piping and septic tanks will be located underneath the streets. Once treated, the recycled wastewater would be utilized as irrigation to assist with on going efforts aimed at re-vegetating slopes with native plants to help to stabilize them against erosion.

The work group believes that this project can be replicated throughout similar areas in the Tijuana River Watershed, providing sewer services to neighborhoods, and improving the environmental health downstream at the estuary. Such systems can meet the challenge of providing full service in cases where a shortage of resources and the use of inadequate technologies have kept basic wastewater services out of the reach of most of the population.

## **Goal**

To help the local community build and maintain a sewer system for a portion of the San Bernardo neighborhood of Los Laureles Canyon.

## **Priorities to advance the goal**

Commitment from CESPT to review the design, help with permitting, provide water quality sampling and analysis, and assist the community of San Bernardo with the long-term operations and maintenance of the system.

## **Strategies**

EWB –SD – will prepare the project application for submittal to EWB-USA (their parent organization), as well as the components of a grant (design, scope, and cost estimate), for submittal to other granting agencies as identified by TRNERR. Once the project has been approved by EWB-USA, EWB-SD will seek partnership with local funding sources. EWB-SD will also work with TRNERR and CESPT to identify the project location and secure the necessary approvals and permits.

TRNERR – will continue assisting EWB - SD on the design, funding, and securing of necessary approvals and permits from the City of Tijuana to build the project. TRNERR, through its Coastal Training Program and with input from EWB - SD, will work with a Mexican non-profit organization to facilitate training in community management of the system.

CESPT –will facilitate the permitting process, plan check the design, and perform water quality sampling and analysis. CESPT will also provide technical assistance during construction, and will oversee the operations and maintenance of the project in the future. In collaboration with EWB-SD and the TRNERR Coastal Training Program, CESPT will help to train the community members to operate and maintain the system.

IMPLAN –will assure CESPT, TRNERR, and EWB – SD that the land is secured and all necessary City approvals have been met.

USEPA, CALEPA, IBWC, and the California Coastal Conservancy – These agencies will seek funding for this project. In addition to the Rotary Club, The Border Environmental Cooperation Commission's (BECC) Border 2012 program provides funding for projects that have the support of the Border 2012 Tijuana Watershed Task Force, that leverage other sources of funds, and that directly help achieve a Border 2012 objective.

The CBC – After funding is identified and a grant prepared, the CBC co-chairs could support the project by writing letters of support to the granting agency or agencies and engage the International Ramsar Committee, which has listed the estuary as a “wetland of international importance.” In addition, letters of support may help the San Diego Chapter of Engineers Without Borders obtain approval to proceed with this project from their parent organization.

## **2. WATER COLLECTORS AND DIVERTERS**

### **Issues**

Urban, agricultural, and industrial uses all impact the Tijuana River Watershed from its headwaters in the mountains of Mexico to its mouth in the United States at the Tijuana River Estuary. Management of this binational watershed is extremely complex given the multiple jurisdictions, and the social and economic differences found in the two countries. Yet, in any fast growing watershed, environmental issues are bound to arise and must be addressed by the governing agencies with the authority to do so. In this watershed rapid development, coupled with a dated water treatment system located near one of the busiest international border crossings in the world, has led to the decline of an estuary of international importance.

The International Boundary and Water Commission (IBWC) installed a system of water collectors, diverters, and pumps to divert excess water in Mexico to treatment plants in the United States. Established in 1889, the International Boundary and Water Commission (IBWC) has responsibility for applying the boundary and water treaties between the United States and Mexico and has rights and obligations over border sanitation and other border water quality problems. The existing water collectors, diverters, and pumps in Smugglers' Gulch and Goat Canyon are only sized to handle low flows; with today's development activity, the area experiences higher levels of water flows. Also, there is not a diverter at Yogurt Canyon, where development activity has caused higher levels of fresh water flow directly into the estuary. By increasing the capacity of this system, there would be a commensurate reduction of polluted water flowing across the border into the estuary.

IBWC is currently analyzing improvements needed to the existing infrastructure and working with the Army Corps of Engineers to determine the scope of improvements. These two agencies could collaborate on a study to determine if enlarging the diverters at Smugglers' Gulch and Goat Canyon, and building a diverter at Yogurt Canyon, would improve conditions at the estuary. Yet, it is recognized that the conditions in this area could change with the construction of the Border Infrastructure Project. The location and size of this project will impact the location, size, and operation of existing and future converters, therefore conducting studies at this time is problematic.

The Department of Homeland Security (DHS) is in charge of the Border Infrastructure Project. They are working with IBWC and the Army Corps of Engineers on the location and size of the project. Concerns have been raised about the operation of the existing diverters during and after project construction, how the project will impact water flows, and how the immediate need for a new diverter at Yogurt Canyon interplays with the border infrastructure project construction schedule.

The BATB committee is recommending that DHS, IBWC, and the Army Corps of Engineers work together to address the immediate needs keeping in mind changing conditions with the placement of the Border Infrastructure Project.

On the Mexican side, CILA recently removed trash and sediment that was affecting the suctioning power of the water pumps and will determine whether or not this action alone will



allow for more water to flow into the system. They have also committed to examining the entire system on the Mexican side to see if there are other improvements or maintenance activities that could help improve the operations of the existing pumps and diverters. They have agreed to prepare a report for the BATB on their findings and prepare recommendations for improvements to the system and its operations.

## **Goal**

To prevent unwanted water flows into the Tijuana River Estuary by improving the existing water collector and diverter system at the international border.

## **Priorities to advance the goal**

Itemize improvements needed at the existing diverters located in Smugglers' Gulch and Goat Canyon, and a new diverter in Yogurt Canyon.

## **Strategies**

Resources Agency – Recommend to DHS enlargement of the Goat Canyon diverter and the Smugglers' Gulch diverter as part of the Border Infrastructure Project (BIP).

IBWC, CILA, USEPA, CESPT – Analyze wet and dry water flows from existing infrastructure designed to capture these flows; determine how the system can be improved, how much it will cost, and funding sources to make improvements. Determine if there are policies and/or permit requirements that would prevent capturing increased flows.

Governor's Office of Homeland Security – Assist the local office of DHS to improve water diversion infrastructure at Smugglers Gulch and Goat Canyon as part of the Border Infrastructure Project. This office could promote the project; encourage funding from the federal government for studies and improvements to the existing system.

In his September 2005 press release, DHS Secretary Chertoff stated DHS's objective that the BIP be accomplished in an environmentally sensitive manner. The Resources Agency and the Governor's Office of Homeland Security should work with DHS to ensure that the capacity of the newly constructed water collectors in Smuggler's Gulch and Goat Canyon are maximized. In addition, CALEPA should recommend to IBWC and DHS that water collectors and diverters be enlarged to capture wastewater prior to reaching the estuary.

Army Corps of Engineers – This agency will design the system for DHS (with important input from IBWC) recognizing needed improvements to protect the Tijuana Estuary.

The CBC – CBC members could send letters to Senators Feinstein and Boxer, and San Diego's local congressional delegates, requesting funding assistance for IBWC and DHS for the necessary improvements.

### 3. SEDIMENT BASINS

#### Issues

One of the greatest environmental threats to the estuary is sediment. Unregulated development and a lack of water and sewer infrastructure in Tijuana have led to a tremendous increase in the flow of sediment, trash, debris, and wastewater into the Reserve. Coastal estuaries are particularly susceptible to the effects of excessive sedimentation. Less than a foot of sediment can choke a tidal channel and discontinue the twice daily tidal exchange that makes estuaries among the most diverse, dynamic and important ecosystems on the planet.

Three south-north canyons in Tijuana cross the border and drain directly into the Reserve: Matadero (Smugglers' Gulch), Los Laureles (Goat Canyon), and Los Sauces (Yogurt Canyon). During a series of storms from October 2004 - January 2005, sediment flowing from these canyons buried over 20 acres of salt marsh habitat in the Reserve, a major loss of coastal wetland. Sediment and trash also filled two recently-built sediment basins (60,000 cubic yards) in the Reserve and then, after they were cleaned out, filled them a second time. Removing the sediment and curtailing future sediment loads requires a cooperative effort among government agencies on both sides of the border.

Controlling sediment requires a three-pronged approach:

1. Improve development practices. To limit downstream impacts, "best management practices" for hillsides and canyons should be adopted as part of land use and open space plans. These practices could include regulations for developing on hillsides, slope stabilization with native plants, building effective retaining walls, and installing pervious pavers on unpaved streets and roads. To date, the Reserve, the Coastal Conservancy, and the City of Tijuana have successfully collaborated on two demonstration projects with the residents of San Bernardo. The first project funded the construction of pervious pavers which, when completed, a neighborhood work party will pave an existing dirt road. The second project purchased native plants which the residents planted on an eroding graded slope.
2. Restore the tidal exchange that allows a healthy estuary to naturally transport sediment out to the ocean at the same time replenishing beaches. The Reserve is working in concert with the California Coastal Conservancy and the Southwest Wetlands Interpretive Association to complete a feasibility study for restoring 250 acres of salt marsh in Border Field State Park.
3. Construct and maintain sediment basins to capture sediment before it enters the estuary system. Sediment basins reduce the damage caused by sediment-laden storm flows in Mexico and the United States. The best locations for basins are on flat land allowing for ease of maintenance and minimizing downstream erosion. Within the three binational canyon systems, potential basin locations have been identified. Future monitoring studies of each basin will provide information on water level flows from Mexico, sediment loads, and best sediment management practices.

Key basin locations and the lead agency for implementation are:

- a. Smuggler's Gulch (located south of Monument Road in the City of San Diego) – This basin should be constructed, managed, and monitored as part of the Department of Homeland Security (DHS) Border Infrastructure Project and would be a significant step toward achieving their environmental goals as stated in Secretary Chertoff's September 2005 press release.
- b. Los Sauces Canyon (located south of the border at the end of a relatively small watershed) – Within the next couple years, most of this watershed will be developed with housing and supportive infrastructure. As development progresses, erosion and the resulting sediment transport will decrease significantly such that installation of a permanent sediment basin is unnecessary. However, this canyon currently acts as a natural sediment basin. The extensive construction in the upper half of the canyon has created a large sediment load adjacent to, and threatening the estuary during the next storm event. It is urgent that this sediment be removed as soon as possible. CESPT and the City of Tijuana should be responsible for removing the sediment. As development permits are issued, the City of Tijuana should require the developers to remove the sediment.
- c. Smuggler's Gulch (located north of Monument Road in the City of San Diego) – The City of San Diego could take the lead in developing and maintaining a basin to enhance the capacity of the current drainage.
- d. Matadero Canyon (located within designated open space in the City of Tijuana) – CILA, the Mexican counterpart to IBWC, has agreed to continue to remove sediment from this defacto basin area adjacent to the international boundary.
- e. Matadero Canyon (located further upstream) – There are a number of potential open space locations that need to be explored. The TRNERR will take the lead facilitating a proposal to fund the construction of a basin; the City of Tijuana will manage and maintain it once it is built.
- f. Los Laureles Canyon (located in the City of Tijuana) – There are a few mid-canyon locations that should be considered for sediment basins. In addition, there are opportunities for two small basins to be constructed as part of the pervious paver road project in San Bernardo, a new community in the upper reaches of the canyon. The TRNERR will take the lead facilitating a proposal to fund the construction of the basins; the City of Tijuana will manage and maintain them once they are built.

## Basin Maintenance

Sediment basins are only effective to the degree that the captured sediment is routinely removed to allow restored basin capacity for the next major storm. In the vicinity of the Research Reserve, there are four basic approaches to sediment removal:

- a. Landfill disposal – This is the most costly approach, exceeding \$22/cubic yard. It is also the most environmentally unsound approach.
  - b. Commercial Re-use – Can be the most economically feasible approach IF the material collected has commercial value. At the existing Goat Canyon sediment basins, a processing pad was constructed and has been utilized by a commercial sand and gravel operation. However, the material collected in the basins has had less value (less sand) than originally hoped; this has proven to be a modest commercial venture, but has still resulted in reduced costs to about \$2/cubic yard. Another problem is that since the material has marginal commercial value, it tends to stay on the processing pad for long periods of time, thereby eliminating the pad as a disposal option for the next series of storm sediment.
  - c. Quarry Restoration – The nearby Nelson-Sloan Quarry was purchased by San Diego County using State Coastal Conservancy funding intended for habitat restoration projects. This quarry site needs over 1 million cubic yards of fill material to restore the natural contours and then proceed with habitat restoration. Removal of basin sediment to this location is an environmental win-win and is economical at about \$5/cubic yard. The County (with the support of other partners) needs to proceed with restoration planning efforts.
3. Surf Zone placement – The sediment coming out of Mexico generally does not meet the standard grain distribution for beach disposal. The standard is 80% sand, 20% fines; the material in the Goat Canyon sediment basins is generally only about 55% sand. However, the 80/20 standard was developed in regions along lower energy coastlines. No scientific data is available for the higher energy coastlines of Southern California to support this standard. As such, the USGS, California Department of Boating and Waterways, California Coastal Conservancy, California State Parks, Southwest Wetlands Interpretive Association and the Reserve are developing an experiment called a Fate and Transport study to determine how sediment disposed in the surf zone is transported and what its ultimate fate is. Scheduled for Fall 2008, the study will distribute 60,000 cubic yards from the Goat Canyon sediment basin into the surf zone at Border Field State Park. Both biotic and abiotic effects will be monitored. If the study concludes acceptable or even positive environmental effects, it will open up an approach to sediment disposal that is both economical and, potentially, environmentally beneficial.

## Goals

To protect the natural functions of the Tijuana River Estuary by stopping the sediment flow from hillsides located upstream from the estuary.

## **Strategies**

TRNERR – through its Coastal Training and Mexico Projects Program, will continue to promote installation and maintenance of the proposed basins. In partnership with the International Community Foundation and other partners, they will take the lead in seeking grant-funding to support projects on both sides of the border. This report serves as a template and justification for that effort. Jointly managed by California State Parks and the National Wildlife Refuge System, TRNERR will rely on the support of the California Biodiversity Council and its lead state and federal conservation agencies.

Some of the specific responsibilities anticipated to allow the installation of sediment basins to proceed are:

CESPT, City of Tijuana, ICF – CESPT could dredge the sediment from Yogurt Canyon in preparation for a conservation easement in the canyon. The International Community Foundation could be asked to work with the City of Tijuana to establish this easement; funding could come from resources committed to removing sediment from areas determined to have conservation value.

CILA, CONAGUA – CILA could remove sediment from Matadero Canyon. CONAGUA could be asked to work with them to establish a timeline for conducting this work and report back to CBC on their progress.

Governor's Office of Homeland Security, County of San Diego – The southern Smugglers' Gulch basin could be built by DHS as part of their BIP with consultation with the County of San Diego as owners of the property.

USGS – This agency could develop erosion-sedimentation models to identify potential sediment sources and sinks and to help determine the most cost effective location and size for each basin in each of the identified canyons. This work would require funding partners. USGS also is potentially available to carry out analyses to compute estimates of what average historical sediment loads would have been, without any development. This could provide quantification of what the effects of development have been.

## **4. WASTE TIRE AND LITTER CLEAN UP**

### **Issues**

Residents of various colonias in Tijuana use waste tires to build foundations and retaining walls for their homes. During storms, large numbers of tires dislodge from their foundations washing down hills and canyons ending up in undesirable locations in the watershed. Each year, up to 4,000 tires are hand plucked from the river, sediment basins, and the sensitive habitats of the Reserve. Many thousands more are unable to be removed due to limited time and resources. (City of San Diego LEA) Some of the tires end up being stored creating stockpiles that have the potential to cause great environmental damage in both countries.

As well, trash – especially plastic bottles – wash down hillsides and canyons during storms, ending up in the Tijuana Estuary. Taxpayer dollars designed to eradicate and prevent trash through anti-litter educational programs cannot be spent in Mexico due to regulations governing the expenditure of these funds.

To advance the goal of eradicating tires and trash from the estuary, the work group identified five needs:

- a. The need to address California's ability to spend funds in Mexico to prevent tire and trash disposal into the Tijuana watershed.

A mechanism needs to be found whereby waste tire and conservation grant funding opportunities from the State of California can be spent in Mexico, primarily in urban areas where large inventories of used tires exist and where litter is prone to wash down the hillsides and into the canyons that drain into the Tijuana Estuary.

- b. The need for training of engineers on how to use waste tires in civil engineering projects including retaining walls, tire derived aggregate, and rubberized asphalt concrete.

Designing and building retaining walls, and other civil engineering projects from waste tires will reduce the number of tires washing down the hill, and will improve public health, control erosion, and put people to work. The states of California and Baja California could work together to identify funding, expertise, and personnel who would benefit from the training.

- c. The need to build a tire recycling plant in San Diego.

Tire recycling plants located throughout the State of California are privately operated; yet receive assistance from the State and the local jurisdiction they service. There is no recycling plant in the County of San Diego. State and local governments could partner to work with prospective tire recycling companies to determine the feasibility of locating a tire recycling facility. Currently there are an estimated three million tires discarded in the County of San Diego. A tire recycling facility should provide disposal rates that are lower than land filling or illegal exportation to Mexico in order to reduce the number of waste tires that are stockpiled, dumped, or moved across the border.

- d. The need for trash consolidators in the Tijuana River.

Trash consolidators separate out the plastic trash prior to reaching sediment basins where removal becomes more problematic. Currently the plastic trash is scattered throughout the basin where it is mixed with the sediment requiring collection by hand. When rain is heavy, water carries the plastic trash over the top of the basins and scatters it in the Reserve, where it breaks down over time, releasing toxic pollutants. The consolidators will separate the plastic trash and collect it in a smaller area for easier and less costly removal.

- e. The need for an anti-litter campaign and recycling programs in Mexico.

Anti-litter and recycling campaigns could be aimed at the general public and the schools of Tijuana. Neighborhood community cleanup events could be funded to clean litter from the most distressed neighborhoods following the lead of community leaders. Funding opportunities could be explored with the Department of Conservation, CIWMB, and /or NADB.

## **Goal**

To eradicate waste tires and trash from the Tijuana Estuary.

## **Priorities to advance the goal**

The Resources Agency, CAL EPA, CIWMB, Department of Conservation, Department of Finance, ICF – Preventing tires and trash from entering the Tijuana River and Estuary is a less expensive fix than funding on-going litter removal and recycling programs. California state agencies and local government departments assigned to eradicate tire piles and litter, and/or fund projects to do so do not have the authority or the power to spend public funds in Mexico. Yet it is acknowledged that addressing the problem upstream is less expensive than cleaning up the aftermath downstream. The Resources Agency shall lead an effort with CAL EPA, CIWMB, Department of Conservation, and Department of Finance, to determine how state funds can be spent cross border on programs designed to eradicate waste tires and trash from the border region.

## **Strategies**

TRNERR – The Department of Conservation has grant funding available for beverage container recycling programs in California and will provide technical assistance as needed. The Department is also partnering with California State Parks to implement beverage container recycling infrastructure throughout state parks in California. As a state park, the estuary may be eligible for potential beverage container recycling infrastructure. TRNERR will work with the Department to secure funding for their recycling programs.

City of Tijuana, Department of Ecology for State of Baja California, SEMARNAT, CIWMB, ICF, Engineers Without Borders – Waste tires that wash into the Tijuana Estuary come from retaining walls and foundations as well as tire dumping in the newly developed colonias located on the hillsides of the City of Tijuana. Many of these developments are constructed without the benefit of standard engineered drawings or skilled labor. Engineers Without Borders could design an effective retaining wall and a foundation made out of tires, then workshops could be conducted to train engineers, developers, contractors, and builders. CIWMB may be able to find funding. This approach is dependent upon the State of California, working with ICF, to grant funds to Mexican agencies that can conduct the training programs.

Department of Conservation – Trash consolidators have been used successfully in rivers throughout the State of California with funding from the Department. The Department could explore the feasibility of funding the placement of a consolidator in the Tijuana River.



CIWMB, Border 2012, City of San Diego, City of Imperial Beach, County of San Diego – The State of California's 5-Year Tire Plan recognizes the unique situation along the Mexican Border for waste tire clean up efforts. The plan also recognizes the need to address the flow of used and waste tires across the border, the need for market development and new technologies for waste tires, and the ongoing need for educational materials on the proper disposal of waste tires. The plan identifies funding and technical assistance for jurisdictions located along the Mexican Border. CIWMB will work with the San Diego jurisdictions and the business community to find new markets for waste tires and to start up a tire recycling plant in the San Diego region. Currently, the closest tire recycling plant is located in Riverside County, making it likely that tires will continue to be disposed in landfills or discarded illegally. Funding could be explored through CIWMB, Border 2012, and or the Solid Waste Environmental Program offered through NADB.

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